



Project Status and Accomplishments

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|---------------------------|----------------|
| • Project Overview | Jean Grady |
| • Reference Configuration | Govind Gadwal |
| • Top Level Requirements | Jay Bookbinder |
| • Technology Overview | Robert Rasche |



Constellation-X Project Overview

- Highlights
- Organization Update
- Budgets and Schedules
- Cost Estimates
- NRA Contract Status

Jean Grady
October 14, 1999



Highlights from Past Year

- **Revised GSFC/SAO reference mission configuration from six to four spacecraft**
 - Results of EELV procurement, consistent with expectations
 - Minimizes launch cost
- **Developed independent cost estimates**
- **State of the Universe annual report presented to Associate Administrator for Space Science on May 18, 1999**
- **Completed first draft of Reference Configuration Description Document**
- **Requirements definition and documentation in process**
 - Top level requirements
 - Derived requirements
- **Outreach**
 - Web Page under revision to increase public appeal and project utility
 - Maintained visibility at scientific and technical conferences

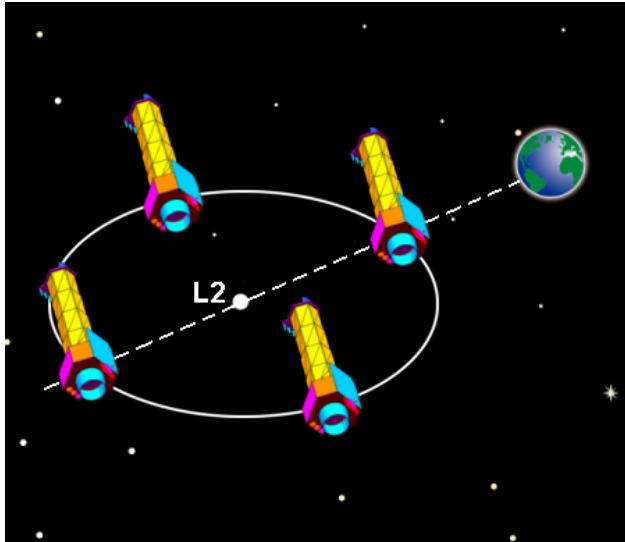


Highlights from Past Year (cont.)

- Fabricated light weight 0.5 meter pathfinder shell for X-ray optics from new nickel alloy
- Achieved 7 arc second glass substrates for segmented optics and made progress on new alignment and support system
- Demonstrated significant improvement in X-ray calorimeter energy resolution, within factor of two of requirement
- Achieved higher resolution, lower noise on CdZnTe detectors
- Preliminary HXT glass mirror characterization shows performance improvement



Constellation-X Mission Concept

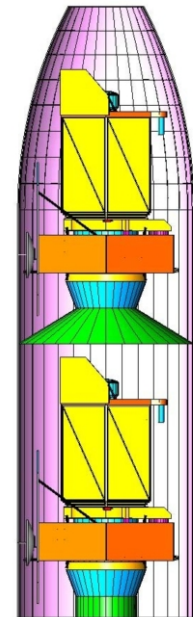


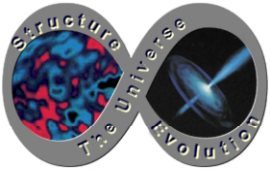
- **A multiple satellite approach**

- To achieve 30,000 cm² aperture on a single satellite requires a Titan-class launch
- An alternative low-risk approach utilizes a constellation of multiple identical low-cost satellites; each carries a portion of the total effective area
- Simultaneous viewing and high efficiency facilitated by using libration point orbit

- **Baseline configuration:**

- Four satellites, launched two at a time on Atlas V or Delta IV
- Extendible optical bench is used to achieve a focal length of 10 m yet allows two satellites to be packaged on a single launch vehicle
- Modular design allows:
 - Parallel development and integration of instrument module and spacecraft bus
 - Low cost standard bus architecture and components



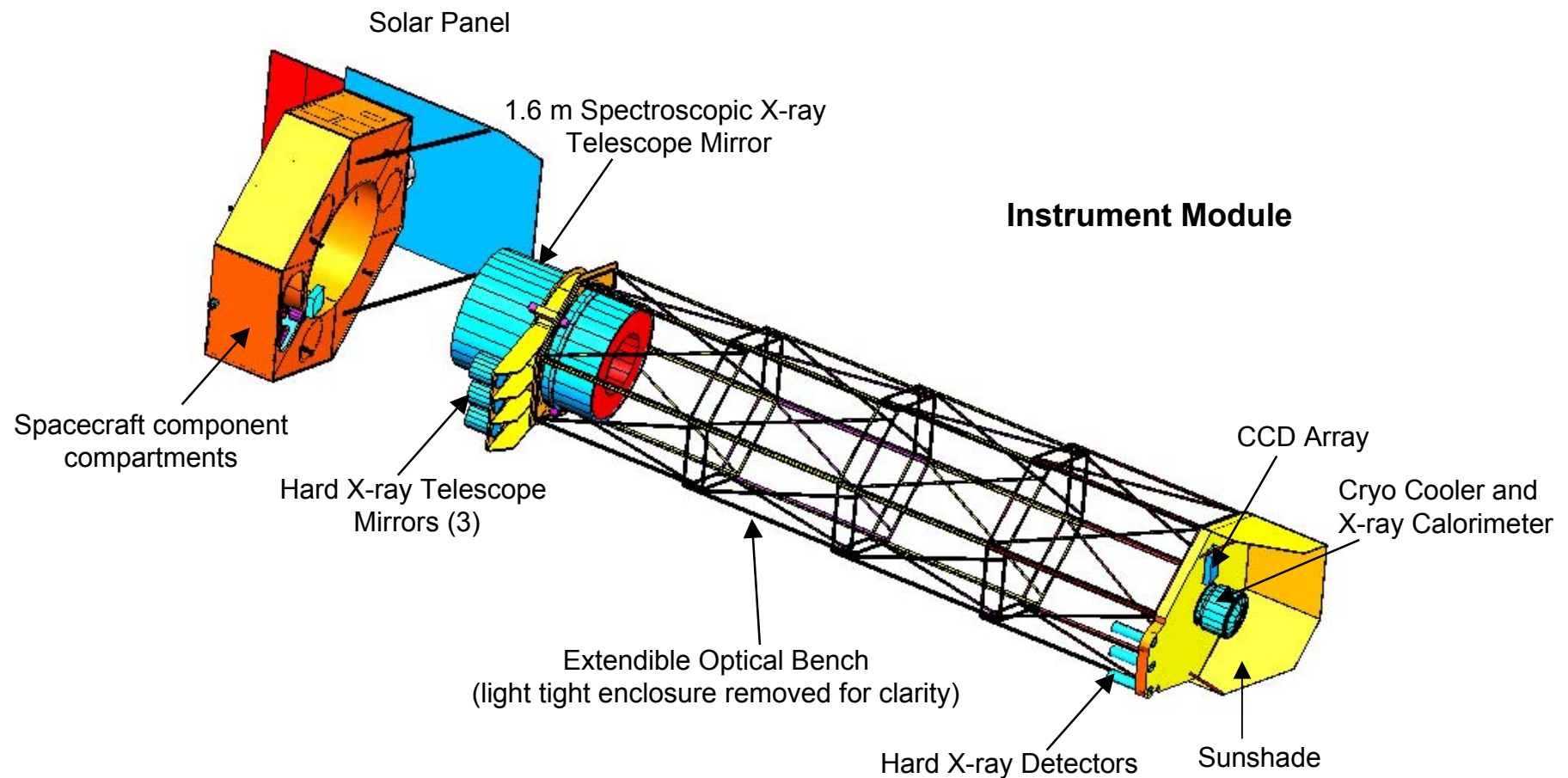


Reference Design

(GSFC/SAO)

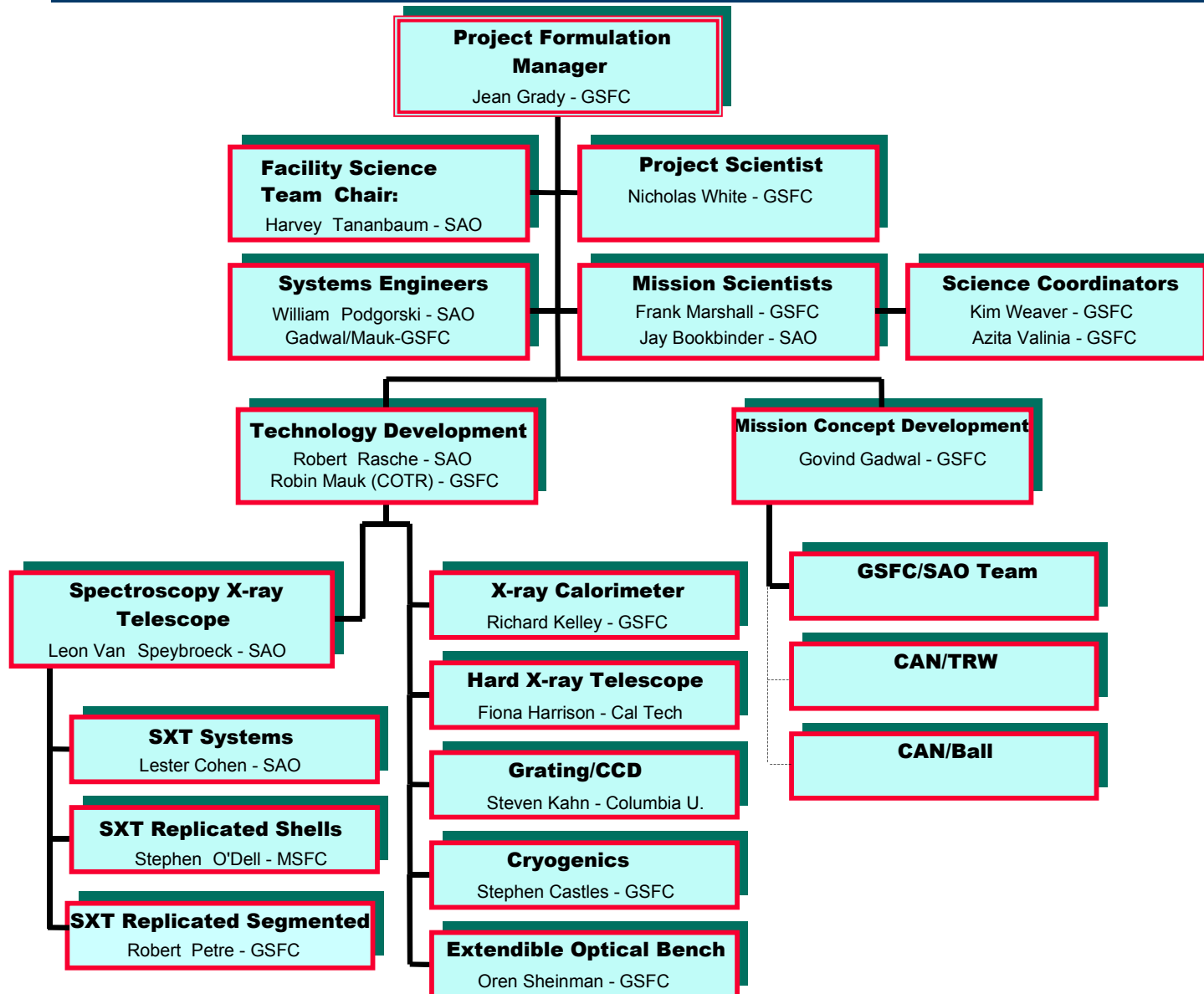
Spacecraft Module

Instrument Module





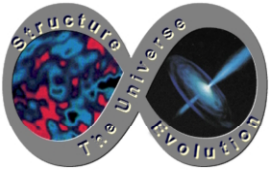
Constellation-X Organization



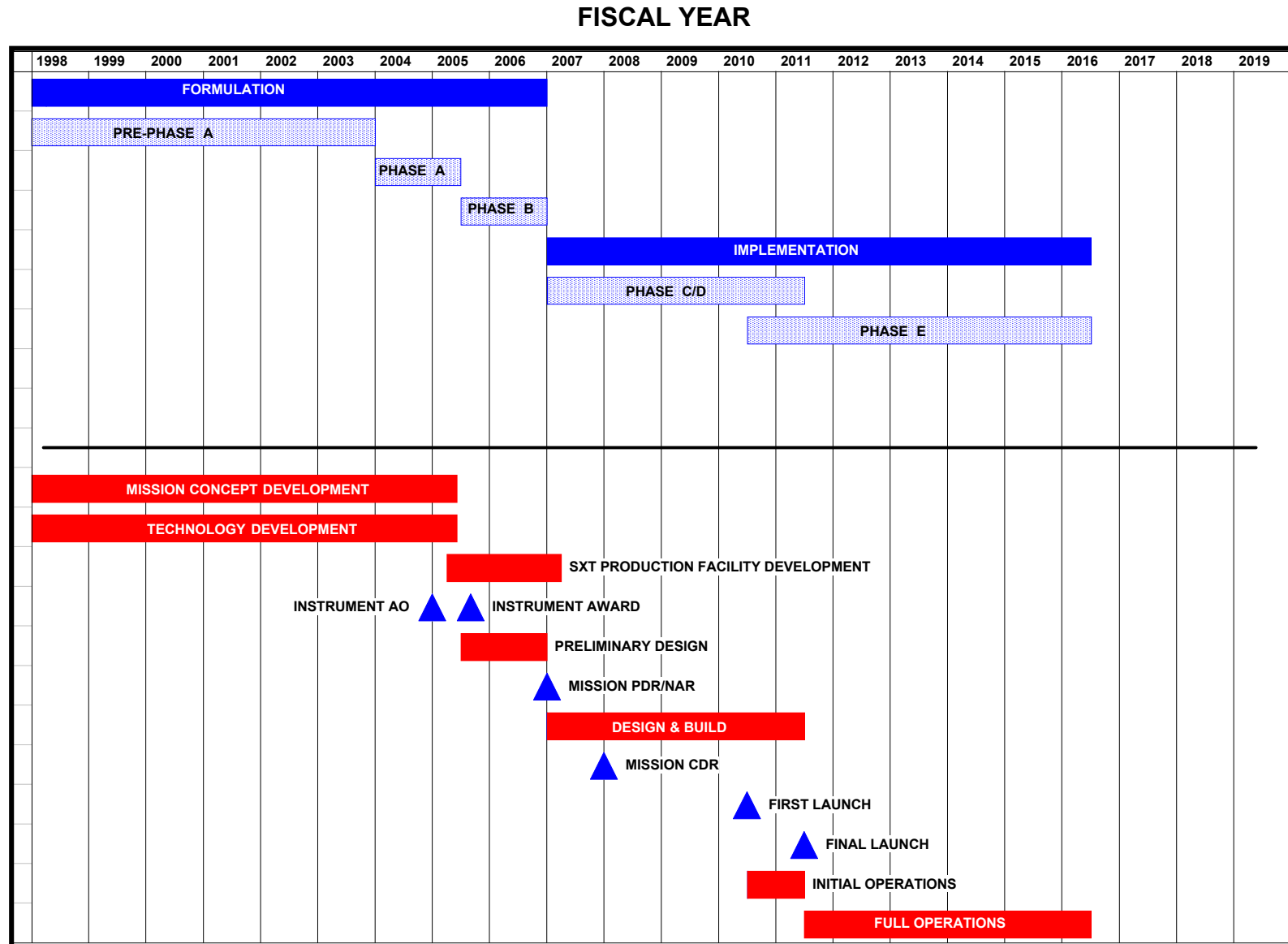


Project Meetings

- **Bi-Weekly study team meetings**
 - Open attendance; see <http://conxproject.gsfc.nasa.gov/> for calendar
- **Plan to have Technology and Project status meetings with IPT Leads and Project Management Team every three to four months**
 - Open attendance; see calendar
 - Next one planned for January/February 2000
- **Facility Science Team meeting**
 - Next one planned for early FY2001
- **Monthly SXT status telecons**
- **Technical and Management Interchange Meetings**
 - Ongoing; as required

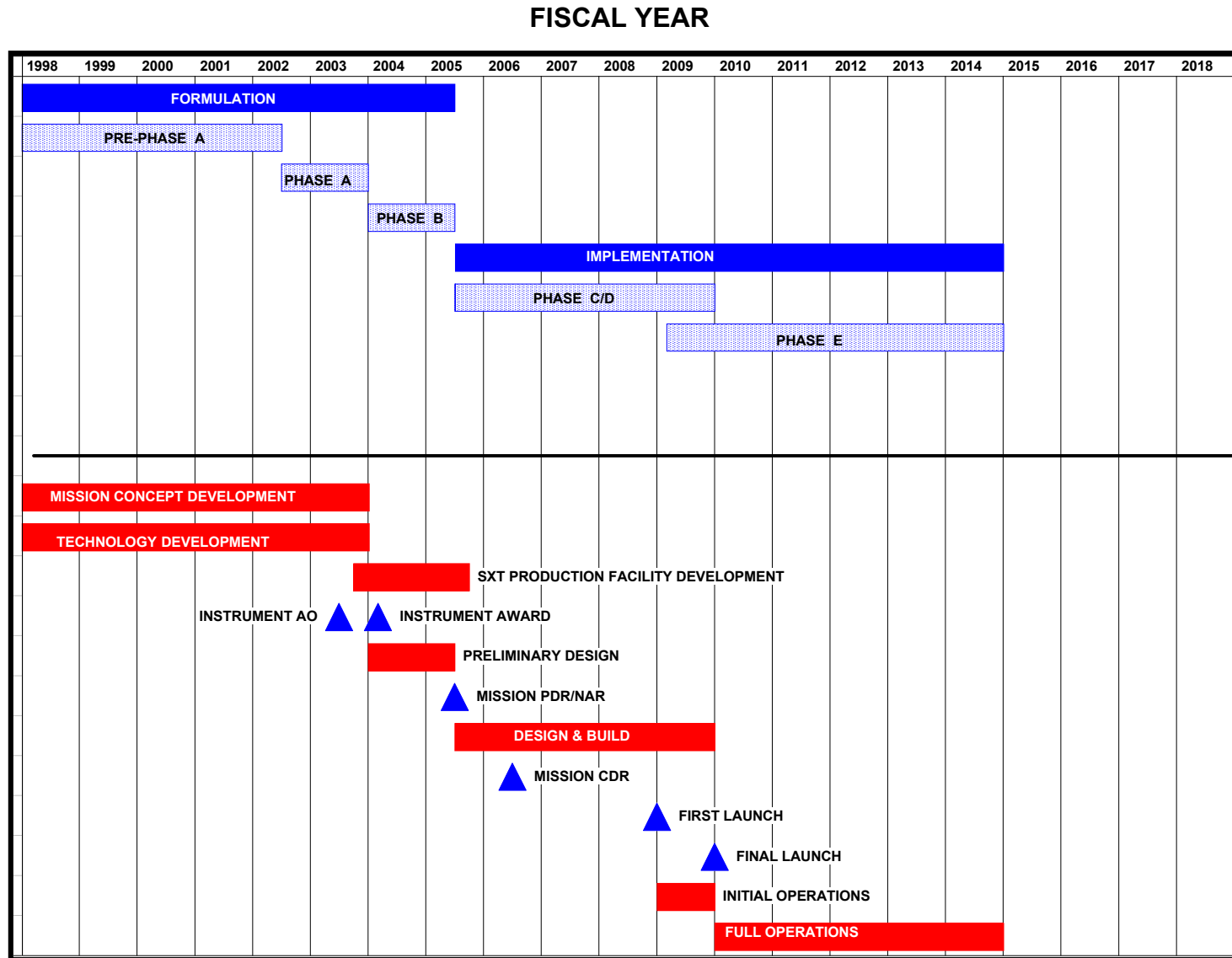


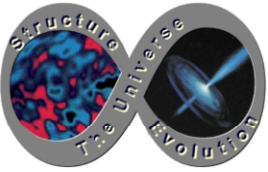
Top Level Schedule Consistent with Guidelines





Top Level Schedule for 2005 New Start





NRA Contract Summary

- **Background**

- Technology Development NRA selections (April 1998):

Caltech/Harrison	Comprehensive Hard X-ray Telescope
Columbia U./Kahn	Grating/CCD
GSFC/Kelley	Comprehensive Microcalorimeter
LLNL/Labov	Multilayer Absorbers Microcalorimeter
Northwestern U./Ulmer	Hard X-ray Optics
NRL/Johnson	Silicon Strip Detectors
Stanford/Cabrera	Tungsten TES Microcalorimeter

- **All basic contracts have been granted no-cost extensions through December 15, 2001**

- Options have been deleted; follow-on work will be sole source



Constellation-X Project Overview Summary

- **Mission Definition is progressing well**
- **Technology development accomplishments are exciting and promising**
- **Project Teams formed and working together**

Need to maintain and build momentum